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DOTE, JANIS L	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/618,640	SUGIURA ET AL.
	Examiner	Art Unit
	Janis L. Dote	1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *19 and 20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/28/03; 9/23/04; 12/16/05*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

1. The examiner acknowledges the cancellation of claim 21 and the amendments to claims 4, 8, 9, and 15 set forth in the amendment filed on Feb. 27, 2006. Claims 1-20 are pending.

2. The "Amendment to the specification" section and the "Amendment to the drawings" section filed on Feb. 27, 2006, did not comply with 37 CFR 1.121 for the reasons discussed in the Notice of non-compliant amendment mailed on May 19, 2006. Accordingly, the "Amendment to the specification" section and the "Amendment to the drawings" section filed on Feb. 27, 2006, have not been entered.

3. The examiner acknowledges applicants' elected species, oxide particles comprising the metal element Ti, set forth in the response filed on Aug. 22, 2005. Claims 1-18 read on the elected species.

Accordingly, claims 19 and 20 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention and nonelected species of invention, there being no allowable generic or linking claim. Applicants timely traversed the restriction (election) requirement in Aug. 22, 2005.

4. The examiner has considered only the material submitted by applicants, i.e., copies of the originally filed claims, abstract, and figures, which were provided by applicants on Nov. 22, 2005, of the US applications listed in the "List of related cases" in the Information Disclosure Statements (IDS) filed on Nov. 28, 2003, and Sep. 23, 2004. The examiner has considered the US application listed on the "List of related cases" in the IDS filed on Dec. 16, 2005.

5. The replacement sheets of Figs. 1 and 2, which were received on Jun. 19, 2006, are acceptable.

6. The objections to the drawings set forth in the office action mailed on Oct. 26, 2005, paragraphs 5 and 6, have been withdrawn in response to the drawing replacement sheets of Figs. 1 and 2 filed on Jun. 19, 2006, and the annotated drawing sheet filed on Jun. 19, 2006, that shows the cancellation of Fig. 7.

The objections to the specification set forth in the office action mailed on Oct. 26, 2005, paragraph 7, have been withdrawn in response to the drawing replacement sheets of Figs. 1 and 2 filed on Jun. 19, 2006, and the amended paragraphs at pages 37,

144 to 149, 160, and 162, of the specification, filed on Jun. 19, 2006.

The objections to the specification set forth in the office action mailed on Oct. 26, 2005, paragraph 8, have been withdrawn in response to the amended paragraph beginning at page 38, line 16, of the specification, filed on Jun. 19, 2006, and the amendments to claims 4, 8, 9, and 15 and the cancellation of claim 21 set forth in the amendment filed on Feb. 27, 2006.

The rejections of claims 8 and 15 under 35 U.S.C. 112, second paragraph, set forth in the office action mailed on Oct. 26, 2005, paragraph 10, have been withdrawn in response to the amendments to claims 8 and 15 filed on Feb. 27, 2006.

The rejection of claim 21 under 35 U.S.C. 102(b) over US 5,430,526 (Ohkubo), set forth in the office action mailed on Oct. 26, 2005, paragraph 14, has been mooted by the cancellation of claim 21 set forth in the amendment filed on Feb. 27, 2006.

The rejection of claims 1-7, 9-14, 16-18, and 21 under 35 U.S.C. 102(a)/103(a) over European Patent 1,319,992 A1 (EP'992), as evidenced by applicants' admissions in the instant specification, set forth in the office action mailed on Oct. 26, 2006, paragraph 15, has been withdrawn in response to the cancellation of claim 21 set forth in the amendment filed on Feb. 27, 2006, and in response to the filing of the certified

English translation of the foreign priority document, Japanese Patent Application No. 2002-205196, on Feb. 27, 2006. Applicants have perfected their claim to foreign priority under 35 U.S.C. 119 for the subject matter recited in instant claims 1-7, 9-14, and 16-18. The certified English-language translation of the priority document provides antecedent basis as set forth under 35 U.S.C. 112, first paragraph, for the subject matter recited in instant claim 1-7, 9-14, and 16-18. Accordingly, EP'992 is no longer prior art with respect to the subject matter recited in instant claims 1-7, 9-14, and 16-18.

The rejections of claims 1, 3, 4, and 9 under 35 U.S.C. 102(a)/103(a) and under 35 U.S.C. 102(e)/103(a) over US 2003/0031946 (Sugiura), as evidenced by applicants' admissions I and of claims 12-18 and 21 under 35 U.S.C. 103(a) over Sugiura combined with the other cited references, set forth in the office action mailed on Oct. 26, 2005, paragraphs 17-19, have been withdrawn in response to the Rule 132 declaration, which was executed by Hideki Sugiura on Feb. 9, 2006, and filed on Feb. 27, 2006. That declaration is sufficient to show that the hydrophobic silicon oxide particles in Sugiura example 1 do not satisfy the circularity SF1 of 100 to 130 and the circularity SF2 of 100 to 125 recited in the instant claims.

7. The disclosure is objected to because of the following informalities:

In the amended paragraph beginning at page 38, line 16, of the specification, filed on Jun. 19, 2006, the specification states that "Si" is a metal element. However, it is well known in the chemical arts that Si is not a metal. See Grant & Hackhs's Chemical Dictionary, fifth edition, page 531, which states that Si is a "nonmetallic element of the carbon group."

Appropriate correction is required.

8. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

In claim 10, the recitation "hydrophobic oxide fine particles having a $R^1{}_3SiO_{1/2}$ unit on a surface thereof . . ." lacks antecedent basis in the specification. See page 30, lines 1-3, of the specification, which describes preferred "hydrophobed spherical silica fine particles having $R^1{}_3SiO_{1/2}$ units on their surface." The phrase "hydrophobic oxide fine particles" is broader than the "hydrophobed spherical silica fine particles" because it encompasses other oxide particles,

such as silicone-oil treated titanium oxide or aluminum oxide particles, without the limitation as to shape.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 6 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 is indefinite in the phrase "metal element is . . . Si" because Si is not a metal. See Grant & Hackhs's Chemical Dictionary, fifth edition, page 531, which states that Si is a "nonmetallic element of the carbon group."

Claim 8 is indefinite in the phrase "the metal element Si" because Si is not a metal.

The phrase in claim 8 is further indefinite for lack of unambiguous antecedent basis for "the metal element Si." Claim 8 does not positively state that the metal element in the oxide fine particles is "Si."

Applicants' arguments filed on Feb. 27, 2006, as applicable to the limitation of metal element Si have been fully considered but they are not persuasive.

Applicants assert that Si is a metal as indicated by the attachments from www.reade.com and www.acialloys.com.

Applicants' assertion is not persuasive. For the reasons discussed in the rejection above, Si is not a metal. Silicon is well known in the chemical arts as a nonmetallic element of the carbon group. Also see Hawley's Condensed Chemical Dictionary, 13th edition, page 996. Applicants' evidence is not persuasive because they are not standard chemical textbooks or chemical dictionaries but printouts from commercial Internet sites of unknown reliability.

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 8 and 15 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over European Patent 1,319,992 A1 (EP'992), as evidenced by applicants' admissions in the instant specification at page 21, lines 2-24, and in Tables 1 and 2, examples 1-11 and comparative examples 3 and 4 (applicants' admission I).

EP'992 discloses a number of two-component developers that comprise a carrier and a toner comprising hydrophobic oxide particles.

In examples 2 and 5 of EP'992, the developers comprise a toner that comprises: (1) toner particles comprising a polyol binder resin and a colorant; (2) hydrophobic oxide particles **2** or **5**; (3) hydrophobic silica particles having a primary particle diameter of 10 nm; and (4) titanium oxide particles having a primary particle diameter of 15 nm. See paragraphs 0257-0259, and examples 2 and 5 in paragraph 0266 and in Table 2. The toner particles have a weight average particle size of 6.5 μm. Hydrophobic oxide particles **2** and **5** have a number average primary particle diameter of 40 nm and 50 nm, respectively. Paragraph 0094 and Table 2. The number average primary particle diameters of 40 nm and 50 nm meet the range of 30 to 300 nm recited in instant claims 8 and 15. The hydrophobic silica particles and titanium oxide particles meet the external additives limitation recited in instant claim 15. Both hydrophobic oxide particles **2** and **5** are obtained by surface treating the oxide particles with the organosilicon coupling agent, hexamethyl disilazane. Hydrophobic oxide particles **2** comprise the metal element Ti, which is uniformly dispersed at the surface and inside parts of the oxide particles.

Paragraph 0056, item (2), and Table 2. EP'992 teaches that the ingredients in the oxide particles are dispersed uniformly in the surface part and into the inside part of the particles. See paragraph 0097. Hydrophobic oxide particles **2** meet the compositional limitations recited in instant claim 8.

EP'992 does not disclose that hydrophobic oxide particles **2** and **5** have a circularity of SF1 and SF2 as recited in the instant claims. Nor does EP'992 disclose that the oxide particles have a standard deviation σ of a particle size distribution as recited in the instant claims. However, as discussed above, the toners disclosed by EP'992 meet the compositional limitations recited in the instant claims. EP'992 further discloses that hydrophobic oxide particles **2** and **5** have a substantially spherical shape and have an average roundness of 0.97. See paragraph 0056, item (1) and Table 2. The average roundness is defined as the "circumference length of [the] corresponding circle/circumference length of projected image of the measured particle." Paragraphs 0095-0096. The instant specification discloses that the toners comprising oxide particles having the SF1 and SF2 values and the particle size distribution recited in the instant claims provide images with stable quality even after storage at low temperatures and low humidity. The toners have excellent image transfer properties,

development properties, and image fixing properties. The toners exhibit satisfactory electrostatic stability, and provide images with no toner scattering. Specification, page 21, lines 2-24, and Table 1. Table 1 shows that when the oxide particles have SF1 and SF2 values that are not within the ranges recited in the instant claims, toner scattering and transfer dust are observed. The images formed have "hollow defects," toner deposition on the background of the images, and poor image density. The toner does not exhibit sufficient transferability, and does not exhibit electrostatic stability in environments of high temperature and high humidity or of low temperature and low humidity. Comparative example 4 in Tables 1 and 2, where the SF1 is 131 and the SF2 is 127. Table 1 also shows that when the oxide particles do not have a particle size distribution as recited in the instant claims, toner scattering is observed. The oxide particles are fully embedded in the surface of the toner particles. The images formed have "hollow defects" and poor thin line reproducibility. Comparative example 3 in Tables 1 and 2, where σ is about 0.09R. EP'992 discloses that the toners in examples 2 and 5 comprising hydrophobic oxide particles **2** or **5** have excellent image transfer properties, development properties, and image fixing properties. Paragraphs 0043-0054. The toners have sufficient

transferability, i.e., fluidity, and exhibit electrostatic stability in environments of high temperature and high humidity and of low temperature and low humidity. The toners provide toner images with good image density, thin line reproducibility, and with no or very few hollow defects, background toner deposition, and toner scattering. The oxide particles are not completely embedded in the surface of the toner particles. EP'992, Table 1, examples 2 and 5. These properties appear to be the same properties sought by applicants. Accordingly, because the toners comprising hydrophobic oxide particles **2** or **5**, in the examples of EP'992 meet the compositional limitations recited in the instant claims, and because the toners appear to have to the properties sought by applicants, it reasonable to presume that the EP'992 hydrophobic oxide particles have a SF1 value, a SF2 value, and a particle size distribution as recited in the instant claims. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

As discussed supra, in the examples of EP'992, EP'992 states that the toner particles have a weight average particle size of 6.5 μm, not a volume average particle size as recited in instant claim 15. However, EP'992 teaches that the toner particles have a volume average particle size of 2 to 10 μm.

Page 8, lines 1-3, and reference claim 6. The particle size value of 6.5 μm is within the numerical range of the volume average particle size of 2 to 7 μm recited in instant claim 12. Thus, based on the reasonable presumption that the toner particles have uniform density, it is reasonable to conclude that the toner particles in the examples of EP'992 have a volume average particle size of 6.5 μm. Accordingly, the burden is on applicants to prove otherwise. Fitzgerald, supra.

Applicants' arguments filed on Feb. 27, 2006, have been fully considered but they are not persuasive.

Applicants assert that EP'992 is not prior art to the subject matter recited in instant claims 8 and 15 because they have perfected their claim to foreign priority under 35 U.S.C. 119 for the subject matter recited in instant claims 8 and 15. Applicants assert that the certified English-language translation of the priority document Japanese Patent Application 2002-205196, filed on Feb. 27, 2006, provides antecedent basis as set forth under 35 U.S.C. 112, first paragraph, for the subject matter recited in instant claims 8 and 15.

However, the certified translation of the priority document does not provide an adequate description of the subject matter recited in instant claims 8 and 15. The translation at page 34,

lines 1-4, discloses that "the composition of the oxide fine particle is preferably evenly dispersed between a surface part and an inside part of the oxide fine particles," not "uniformly dispersed over a surface of the oxide particles and inside of the oxide fine particles" as recited in instant claim 8. The translation in paragraph 39 describes "one or more kinds of external additive having a small average particle diameter of a primary particle." The translation does not describe that the one or more kinds of external additive have "an average particle diameter of primary particles <u>smaller than that of the oxide fine particles</u>" as recited in instant claim 15. Accordingly, applicants have not perfected their claim to foreign priority for the subject matter recited in instant claims 8 and 15. EP'992 remains as prior art with respect to the subject matter recited in instant claims 8 and 15.

13. Claims 1, 3-6, and 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 4,983,369 (Barder), as evidenced by applicants' admissions at page 39, lines 20-23, page 40, lines 9-14, and page 41, lines 3-4, of the instant specification (applicants' admission II).

Barder teaches microspheres of silicon oxide having an average particle diameter 0.3 μm $\pm$ 0.1 μm, i.e., 300 nm $\pm$ 100 nm. Example VIII at cols. 8-9. The microspheres meet the compositional limitations recited in instant claims 1, 5, 6, and 8.

Barder does not expressly state that the average particle diameter is a number average particle diameter. Nor does Barder state that the microspheres of silicon oxide have circularities SF1 and SF2 as recited in the instant claims. However, the numerical value of the Barder average particle size of 300 nm is within the range of numerical values of the number average particle diameter of 30 nm to 300 nm recited in instant claim 1. The numerical value of the Barder standard deviation of the average particle diameter of 100 nm also is within the numerical value of standard deviation σ ranges recited in instant claims 1 and 3. According to Barder, the particle size is determined by examining a scanning electron microscope (SEM) photographic of the particles. Col. 7, lines 4-7. The instant specification at page 39, lines 20-23, and page 40, lines 9-14, discloses that the number average particle diameter can be determined by using a scanning electron microscope. Thus, it is reasonable to conclude that the Barder average particle diameter and standard deviation are based on number average as recited in the instant

claims. The burden is on applicants to prove otherwise. Fitzgerald, supra. In addition, as discussed supra, the Barder silicon oxide particles are described as "microspheres." See, for example, Fig. 2. According to the instant specification at page 41, lines 3-4, "[i]f a particle is exactly spherical, the particle has both SF1 and SF2 of 100." Accordingly, because the Barder silicon oxide particles are described as "microspheres," it is reasonable to presume that they have a SF1 value and a SF2 value as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

14. Claims 1-10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,248,495 B1 (Inokuchi), as evidenced by applicants' admissions in the instant specification at page 41, lines 3-4, and in Tables 1 and 2, examples 1-13 and comparative examples 1-4 (applicants' admissions III).

Inokuchi discloses hydrophobic spherical silicon oxide particles having a particle size distribution of 20 to 250 nm. The hydrophobic spherical silicon oxide particles are obtained by surface treating spherical silicon oxide particles with hexamethyldisilazane, which introduces a $R^1{}_3SiO_{1/2}$ unit on the surface of the silicon oxide particles. Col. 3, lines 35-53;

and example 1 at cols. 4-5 and in Tables 1 and 2. The hydrophobic spherical silicon particles comprise 40 ppb or less of Ti. The Inokuchi hydrophobic spherical silicon oxide particles meet the compositional limitations recited in instant claims 1 and 5-10.

Inokuchi does not disclose that its spherical hydrophobic silicon oxide particles have circularities SF1 and SF2 as recited in the instant claims. Nor does Inokuchi disclose that its spherical hydrophobic silicon oxide particles have a number average particle size and standard deviation σ of a particle size distribution as recited in the instant claims. However, as discussed above, the Inokuchi hydrophobic spherical silicon oxide particles meet the compositional limitations recited in the instant claims. Inokuchi describes the hydrophobic silicon oxide particles as "spherical." The particles have a particle size distribution of 20 to 250 nm.

According to the instant specification at page 41, lines 3-4, "[i]f a particle is exactly spherical, the particle has both SF1 and SF2 of 100." The instant specification also discloses that the toners comprising oxide particles having the SF1 and SF2 values, the number average particle size, and the particle size distribution recited in the instant claims provide images with very little or no "hollow defects." See Table 1,

examples 1-13. Table 1 shows that when the oxide particles have SF1 and SF2 values that are not within the ranges recited in the instant claims, the toner provides images having "hollow defects." Comparative example 4 in Tables 1 and 2, where the SF1 is 131 and the SF2 is 127. Table 1 also shows that when the oxide particles do not have the number average particle size or a particle size distribution as recited in the instant claims, the toner provides images having "hollow defects." The "hollow defects" are formed from untransferred toner. Comparative examples 1 and 2 in Tables 1 and 2, where the number average particle size is 310 nm and 28 nm, respectively; and example 3 in Tables 1 and 2, where σ is about 0.09R. According to Inokuchi, when its hydrophobic silica particles are used as an external additive in toners, the toners have improved fluidity and cleaning characteristics, as well as stable and uniform charging characteristics. Col. 1, lines 45-56. The toners provide images with no white spots, i.e., no adhesion of the toner to the photoconductor. In other words, there is no untransferred toner. Col. 6, lines 59-67, and Table 2, example 1. These properties appear to be the same properties sought by applicants. Accordingly, because the Inokuchi hydrophobic silicon oxide particles in the example 1 meet the compositional limitations recited in the instant claims and are

described as "spherical," and because when said hydrophobic spherical silicon oxide particles are used as the external additive in toners, the toners appear to have to the properties sought by applicants, it reasonable to presume that the Inokuchi spherical hydrophobic silicon oxide particles have the SF1 value, the SF2 value, the number average particle size, and the particle size distribution as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

15. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inokuchi, as evidenced by applicants' admissions III, combined with US 2001/0051270 A1 (Yamashita).

Inokuchi, as evidenced by applicants' admission III, discloses hydrophobic spherical silicon oxide particles as described in paragraph 14 above, which is incorporated herein by reference. As discussed in paragraph 14 above, Inokuchi discloses that the hydrophobic spherical silicon oxide particles are obtained by surface treating spherical silicon oxide particles with hexamethyldisilazane, which introduces a $R^1{}_3SiO_{1/2}$ unit on the surface of the silicon oxide particles.

Yamashita teaches that hydrophobic inorganic particles, such as hydrophobic silica particles, can be further treated

with a silicone oil, such that the oil-treated inorganic particles have a free silicone degree, i.e., liberation degree of silicone oil of 10 to 70%. Paragraphs 0025-0027 and 0105-0110; and paragraph 0102, which discloses that the inorganic particles can be treated with a hydrophobizing agent before the silicone oil treatment. The free silicone degree of 10 to 70% meets the liberation degree of silicone oil range of 10 to 95% recited in instant claim 11. According to Yamashita, when said oil-treated silica particles are used as an external additive in a toner, the toner provides good quality images with "good fixing property without causing image omissions even when used for paper-drive image forming method." Paragraph 0022. According to Yamashita, "[w]hen the free silicone degree is too small, the effect (i.e., to prevent image omissions) can hardly be exerted. To the contrary, when the free silicone degree is too large, adverse effects such as deterioration of resolution and image density of the resultant images are exerted." Paragraphs 0046 and 0050. Thus, the reference recognizes that the free silicone degree is a result-effective variable. The variation of a result-effective variable is presumably within the skill of the ordinary worker in the art.

It would have been obvious for a person having ordinary skill in the art to further treat the Inokuchi hydrophobic

spherical silicon oxide particles with silicone oil as taught by Yamashita, such that the resultant silicone oil treated hydrophobic spherical silicon oxide particles have a free silicone degree of 10 to 70%. That person would have had a reasonable expectation of successfully obtaining silicone oil treated hydrophobic spherical silicon oxide particles that when used as an external additive in a toner, the toner provides good quality images with "good fixing property without causing image omissions" as disclosed by Yamashita.

16. Claims 12-14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inokuchi, as evidenced by applicants' admissions III, combined with US 6,080,519 (Ishiyama).

Inokuchi, as evidenced by applicants' admission III, discloses hydrophobic spherical silicon oxide particles as described in paragraph 14 above, which is incorporated herein by reference.

Inokuchi further discloses a two-component developer comprising a carrier and a toner. The color toner comprises: (1) color toner particles; and (2) the hydrophobic spherical silicon oxide particles of example 1. Col. 5, lines 21-29; col. 6, lines 59-67. The hydrophobic spherical silicon oxide

particles of example 1 are present in an amount of 1.0 part by weight based on 100 parts by weight of the toner, which meets the amount ranges recited in instant claims 13 and 14. The toner particles comprise a polyester binder resin, which meets the toner binder resin limitation recited in instant claim 17.

The Inokuchi toner particles have an average particle size of 7 μm. Inokuchi does not expressly describe the average particle size as a volume average particle size as recited in instant claims 12 and 18. However, the numerical value of the average particle size is within the range of numerical values of the volume average particle size of 2 to 7 μm recited in instant claims 12 and 18.

Ishiyama teaches that when the volume average particle size of the toner is less than 2 μm, the charge property of the toner is insufficient and lowers the developing property (i.e., developing quality). If the volume average particle size is greater than 9 μm, the resolution of the image is degraded. Col. 7, lines 22-27. The range of 2 to 9 μm overlaps the range of 2 to 7 μm recited in instant claims 12 and 18. Thus, the toner art recognizes the volume average particle size as being a result-effective variable. The variation of a result-effective variable is presumably within the skill of the person having ordinary skill in the art.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Ishiyama, to adjust, through routine experimentation, the particle size of the toner particles disclosed by Inokuchi, such that the resultant toner particles have a volume average particle size within the scope of instant claims 12 and 18. That person would have had a reasonable expectation of successfully obtaining a toner that provides images with improved resolution.

17. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inokuchi, as evidenced by applicants' admissions III, combined with Ishiyama, as applied to claim 12 above, further combined with US 5,554,478 (Kuramoto).

Inokuchi, as evidenced by applicants' admission III, combined with the teachings in Ishiyama renders obvious a color toner as described in paragraph 16 above, which is incorporated herein by reference.

Inokuchi does not exemplify color toner particles comprising a polyol resin binder as recited in instant claim 16.

Kuramoto discloses a polyol binder resin that comprises a main chain portion containing an epoxy resin moiety and a polyoxyalkylene moiety. Col. 3, lines 52-56. The polyol binder resin is synthesized by reacting (1) an epoxy resin, (2) a

dihydric phenol, and (3) either an alkylene oxide adduct of a dihydric phenol or a glycidyl ether thereof. See Synthesis Example 1 at col. 8. Said binder resin meets the polyol recited in instant claim 16. According to Kuramoto, color toners comprising said binder resin provide images with excellent color reproducibility and uniform glossiness. Col. 3, lines 32-35, and col. 19, lines 14-17. Said toners also have excellent environmental stability. Col. 3, lines 39-41.

It would have been obvious for a person having ordinary skill in the art to use the Kuramoto polyol binder resin as the binder resin in the toner rendered obvious over the combined teachings of Inokuchi, as evidenced by applicants' admission III, and Ishiyama. That person would have had a reasonable expectation of successfully obtaining a color toner that has excellent environmental stability and that provides color images with excellent color reproducibility and uniform glossiness.

18. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inokuchi, as evidenced by applicants' admissions III, combined with Ishiyama, as applied to claim 12 above, further combined with US 5,705,303 (Ichimura).

Inokuchi, as evidenced by applicants' admission III, combined with the teachings in Ishiyama renders obvious a color toner as described in paragraph 16 above, which is incorporated herein by reference.

Inokuchi does not exemplify a toner comprising an additional external additive as recited in instant claim 15. However, Inokuchi teaches that other additives may be blended with the toner particles. col. 3, lines 63-64.

Ichimura teaches that particular crystalline titanium dioxide particles having a primary particle size of 18 nm can be used as a toner external additive. See sample no. 10 in Table 1 at col. 8. According to Ichimura, when a toner comprises said crystalline titanium dioxide particles, the toner is "prevented from agglomerating" and "causes no scratches or filming on a photoreceptor." Col. 1, lines 56-61; example 10 in Table 1; and example 20 in Table 2. Ichimura further teaches that the particular crystalline titanium dioxide particles can be used in combination with other external toner additives, such as hydrophobic silica particles. Col. 6, line 66, to col. 7, line 3, and example 20 in Table 2. As discussed in paragraph 16 above, the Inokuchi hydrophobic spherical silicon oxide particles have a particle size distribution of 20 to 250 nm. Thus, it is reasonable to conclude that the Inokuchi silicon

oxide particles have an average particle size that is within the range of 20 to 250 nm. Accordingly, it is reasonable to presume that the particular Ichimura crystalline titanium dioxide primary particle size of 18 nm is smaller than the average particle size of the Inokuchi hydrophobic spherical silicon oxide particles. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art to externally add the particular Ichimura crystalline titanium dioxide particles to the toner rendered obvious over the combined teachings of Inokuchi, as evidenced by applicants' admission III, and Ishiyama. That person would have had a reasonable expectation of successfully obtaining a toner that is "prevented from agglomerating" and "causes no scratches or filming on a photoreceptor" as taught by Ichimura.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

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JLD
Sep. 3, 2006